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(71) Applicant (for all designated States except US): MAT-SUSHITA ELECTRIC INDUSTRIAL CO. LTD.  
[JP/JP]; 1006, Oaza Kadoma, Kadoma-shi, Osaka, 5718501 (JP).

(71) Applicant (for US only): YAMAMICHI, Masami (heir of the deceased inventor).

(72) Inventor: YAMAMICHI, Masato (deceased).

(72) Inventors; and

(75) Inventors/Applicants (for US only): FUTA, Yuichi.  
OHMORI, Motoji. TATEBAYASHI, Makoto.

(74) Agent: NII, Hiromori; c/o NII Patent Firm, 3rd Floor, Shin-Osaka Suehiro Center Bldg., 11-26, Nishinakajima 3-chome, Yodogawa-ku, Osaka-shi, Osaka 5320011 (JP).

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(54) Title: PARAMETER GENERATION APPARATUS, ENCRYPTION SYSTEM, DECRYPTION SYSTEM, ENCRYPTION APPARATUS, DECRYPTION APPARATUS, ENCRYPTION METHOD, DECRYPTION METHOD, AND PROGRAM THEREOF

Formula storage unit	
Lattice constant GL	2.12
Decryption time evaluation formula EF	$\log(T)=0.04N-6.2$
Lattice constant GL	3.5
Decryption time evaluation formula EF	$\log(T)=0.08N-4.8$
Lattice constant GL	4.6
Decryption time evaluation formula EF	$\log(T)=0.13N-4.4$
Conditional expression ED	$6d+2df-1 < q/2$
Initial security determination formula IF	$\log(T)=0.2002N-18.884$

(57) Abstract: A parameter generation apparatus for generating parameters causing no decryption error for an NTRU cryptosystem so that an encrypted communication can be carried out between an encryption apparatus and a decryption apparatus in a secure and reliable manner, is comprised of: a provisional parameter generation unit operable to generate a set of provisional parameters that do not cause any decryption errors, based on error condition information that is provided in advance, said error condition information indicating a condition for causing no decryption error; and an output parameter generation unit operable to generate an output parameter that does not cause any decryption errors, using said set of provisional parameters, based on a lattice constant that is calculated from said set of provisional parameters.

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